

# NOTES 01: DATA

Stat 120 | Fall 2025

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## 1 The Structure of Data

**Cases**

**Variables**

## 2 Types of Variables

**Quantitative**

**Categorical**

**Explanatory**

**Response**

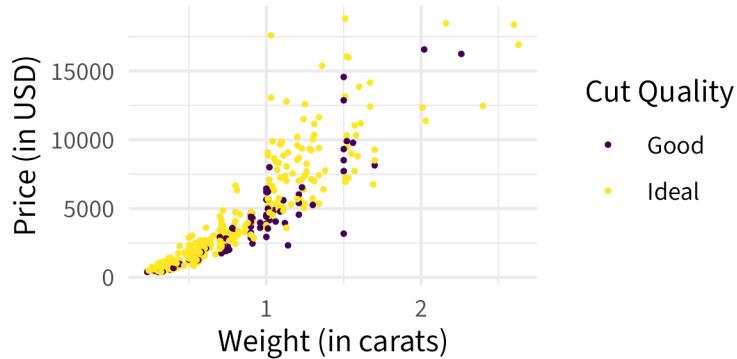
## 3 Examples

Label the *cases* and *variables*. For each variable, state whether it is *categorical* or *quantitative*. Indicate if there's clear *response* or *explanatory* variables

### 3.1 Penguins

```
# A tibble: 344 x 8
  species island   bill_length_mm bill_depth_mm flipper_length_mm body_mass_g
  <fct>   <fct>        <dbl>        <dbl>        <dbl>        <int>
1 Adelie  Torgersen     39.1       18.7       181      3750
2 Adelie  Torgersen     39.5       17.4       186      3800
3 Adelie  Torgersen     40.3       18         195      3250
4 Adelie  Torgersen     NA          NA          NA        NA
5 Adelie  Torgersen     36.7       19.3       193      3450
6 Adelie  Torgersen     39.3       20.6       190      3650
7 Adelie  Torgersen     38.9       17.8       181      3625
8 Adelie  Torgersen     39.2       19.6       195      4675
9 Adelie  Torgersen     34.1       18.1       193      3475
10 Adelie Torgersen      42         20.2       190      4250
# i 334 more rows
# i 2 more variables: sex <fct>, year <int>
```

### 3.2 Price of diamonds by carat and cut quality



### 3.3 Is there a "Sprinting Gene"?

A gene called ACTN3 encodes a protein which functions in fast-twitch muscles. Some people have a variant of this gene that cannot yield this protein. To address the question of whether this gene is associated with sprinting ability, geneticists tested people from three different groups: world-class sprinters, world-class marathon runners, and a control group of non-athletes. In the sprints tested, 6% of the sprinters had the gene variant, compared with 18% of non-athletes and 24% of the marathon runners.

Sketch out a possible dataset, and then answer the questions.